

## KONDNER ENGINEERING AND TECHNICAL SERVICES

19624 DOWNES ROAD  
PARKTON, MARYLAND 21120  
Telephone 410-329-6548

CIVIL ENGINEERING  
SITE EVALUATION  
SITE PLANNING  
SOIL TEST BORINGS  
LABORATORY TESTING  
ENGINEERING REPORTS  
ENVIRONMENTAL STUDIES

ENGINEERING SERVICES FOR LAWYERS  
FORENSIC ENGINEERING  
FOUNDATION ENGINEERING  
UNDERGROUND STRUCTURES  
CONCRETE & STRUCTURAL DESIGN  
EARTH DYNAMICS  
CONSTRUCTION INSPECTION

WATER VAPOR CONDENSATION DAMAGE TO MANUFACTURED HOUSING

IN

THE HOT, HUMID CLIMATE OF THE SOUTHEASTERN UNITED STATES

MANUFACTURED HOME

OF

ROBERT FORD  
15101 SECTION LINE ROAD  
WILMER, ALABAMA

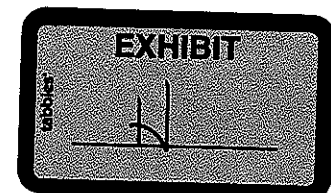
For

Beasley, Allen, Crow, Methvin, Portis & Miles, P.C.  
Mr. Gibson Vance  
218 Commerce Street  
Montgomery, Alabama 36104

November 30, 2007

By

  
Dr. Robert L. Kondner, P.E.



## INTRODUCTION

The hot, humid climate of the southeastern part of the United States requires careful consideration of potential moisture problem mitigation during the construction and siting of manufactured housing governed by the Department Of Housing And Urban Development (HUD) under 24CFR3280. The manufactured home of Robert Ford located at 15101 Section Line Road, Wilmer, Alabama is located within the hot, humid and fringe climatic zone defined by HUD and, as such, subject to the conditions and regulations generated for such climatic locations.

The manufactured home at 15101 Section Line Road has been inspected by R. T. Bonney and Associates, Inc. and the results of that inspection are contained within their report dated June 26, 2006. In addition, the Robert Ford manufactured home also was inspected on June 26, 2006 for elevated moisture within the perimeter walls, mold growth and penetrations of the building envelope by Healthy Homes of Louisiana, L.L.C., the results of which are contained in their report:

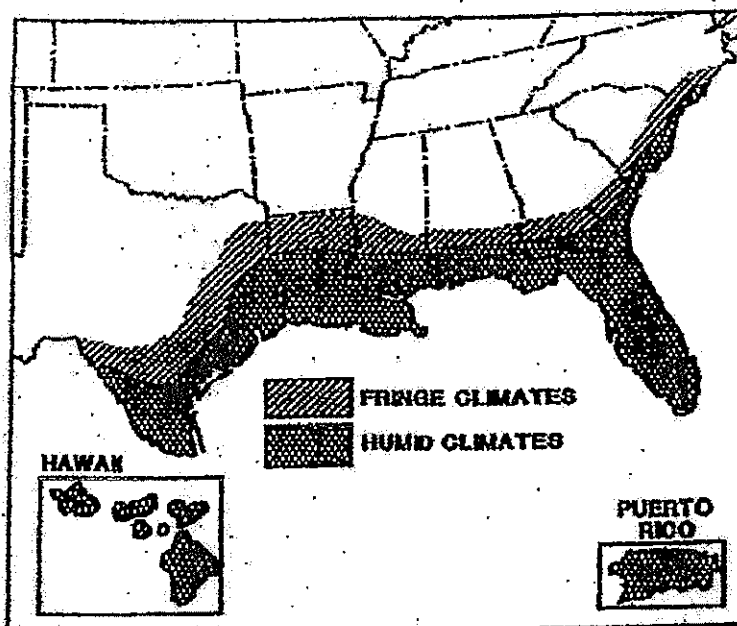
## CLIMATIC LOCATIONS

The geographic areas of the southeastern U.S. deemed to be within these hot, humid and fringe climatic conditions are shown in Figure 1 as expressed by HUD in the Federal Register, Vol. 67, No. 79, April 24, 2002. All or parts of Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Texas denoted by counties, are deemed by HUD to be within the hot, humid and fringe climatic conditions.

20402 Federal Register/Vol. 67, No. 79/Wednesday, April 24, 2002/Rules and Regulations

**Humid and Fringe Climate Map**

FIGURE 1



F. The following areas of local governments (counties or similar areas, unless otherwise specified), listed by State, are deemed to be within the humid and fringe climate areas shown on the Humid and Fringe Climate Map, and this waiver may be applied to homes built to be sited within these jurisdictions:

**Alabama**

Baldwin, Barbour, Bullock, Butler, Choctaw, Clarke, Coffee, Conecuh, Covington, Crenshaw, Dale, Escambia, Geneva, Henry, Houston, Lowndes,

Marion, Mobile, Monroe, Montgomery, Pike, Washington, Wilcox

**Florida**

All counties and locations within the State of Florida.

**Georgia**

Appling, Atkinson, Bacon, Baker, Ben Hill, Berrien, Brantley, Brooks, Bryan, Calhoun, Casada, Charlton, Chatham, Clay, Clinch, Coffee, Colquitt, Cook, Crisp, Decatur, Dougherty, Early, Echols, Effingham, Evans, Glynn, Wayne, Grady, Irwin, Jeff Davis, Lanier, Lee, Liberty, Long, Lowndes, McIntosh, Miller, Mitchell, Pierce, Quitman,

Randolph, Seminole, Tattnall, Terrell, Thomas, Tift, Turner, Ware, Worth

**Louisiana**

All counties and locations within the State of Louisiana.

**Mississippi**

Adams, Amite, Clairborne, Clarke, Copiah, Covington, Forrest, Franklin, George, Greene, Hancock, Harrison, Hinds, Issaquena, Jackson, Jasper, Jefferson, Jefferson Davis, Jones, Lamar, Lawrence, Lincoln, Pearl River, Perry, Pike, Rankin, Simpson, Smith, Stone, Walthall, Warren, Wayne, Wilkinson,

Federal Register/Vol. 67, No. 79/Wednesday, April 24, 2002/Rules and Regulations 20403

**North Carolina**

Brunswick, Carteret, Columbus, New Hanover, Onslow, Pender

**South Carolina**

Jasper, Beaufort, Colleton, Dorchester, Charleston, Berkeley, Georgetown, Horry

**Texas**

Anderson, Angelina, Aransas, Atascosa, Austin, Bastrop, Bee, Bexar, Brazoria, Brazos, Brooks, Burleson, Caldwell, Calhoun, Cameron, Camp, Cass, Chambers, Cherokee, Colorado,

Comal, De Witt, Dimmit, Duval, Falls, Fayette, Fort Bend, Franklin, Freestone, Frio, Garrettsville, Galveston, Gonzales, Gregg, Grimes, Guadalupe, Hardin, Harris, Harrison, Hays, Henderson, Hidalgo, Hopkins, Houston, Jackson, Jasper, Jefferson, Jim Hogg, Jim Wells, Karnes, Kaufman, Kennedy, Kinney, Kleberg, La Salle, Lavaca, Lee, Leon, Liberty, Limestone, Live Oak, Madison, Marion, Matagorda, Maverick, McMullen, Medina, Milam, Montgomery, Morris, Nacogdoches, Navarro, Newton, Nueces, Orange, Pano, Polk, Raines, Refugio, Robertson,

Rusk, Sabine, San Augustine, San Jacinto, San Patricio, Shelby, Smith, Starr, Titus, Travis, Trinity, Tyler, Upstater, Uvalde, Val Verde, Van Zandt, Victoria, Walker, Waller, Washington, Webb, Wharton, Willacy, Williamson, Wilson, Wood, Zapata, Zavala

Dated: April 18, 2002.

John C. Weisberg,  
Assistant Secretary for Housing, Federal  
Housing Commissioner.

[FR Doc. 02-9060 Filed 4-23-02; 8:45 am]

BILLING CODE 4210-37-P

### MANUFACTURED HOUSING PERFORMANCE IN HOT, HUMID CLIMATES

For years manufactured housing in the hot, humid climate of the southeastern part of the United States has suffered from water vapor condensation moisture problems caused by humid, hot, moisture -- laden outside air penetrating the exterior envelope of the home and coming into contact with cooler, less permeable interior surfaces such as vinyl wall or floor coverings, resulting in soft and deteriorating wallboards, extensive mold formation, buckled floors, damaged wood trim and molding, and health concerns that have prevented the manufactured housing from meeting the performance requirements of HUD 24CFR 3280 that "all construction methods shall be in conformance with accepted engineering practices to insure durable, livable, and safe housing and shall demonstrate acceptable workmanship reflecting journeyman quality of work of the various trades".

It is important to consider the relative permeability of various wall, ceiling, and floor products used in manufactured housing in the hot, humid, and fringe climates of the United States. For example, 3/8 inch gypsum wall board laminated with paper having a water based top coat had a measured permeability of 11.44 perms while the same wall board laminated with 4 mil vinyl had a measured permeability of 0.42 perms, a difference of 2724 percent, resulting in a nearly impermeable inside wall surface when vinyl is used as the exterior wall living space side covering. This virtually guarantees the condensation of water vapor on the backside of the vinyl covered surface within the exterior wall structure. It is also important to consider whether the impermeable surface is continuous or discontinuous. For discontinuous impermeable surfaces, it is possible for the water vapor to escape through the discontinuities.

In response to the extensive history of complaints of the damages caused by these water vapor condensation moisture problems in hot, humid climates, HUD in March 2000 issued a waiver process for CFR 3280.504 "Condensation control and installation of vapor retarders." Prior to March 2000, CFR 3280.504 did not make a distinction among the various climatic conditions of

the United States for water vapor condensation control and the construction installation of vapor retarders. The waiver process allows manufacturers of manufactured houses constructed to be sited in hot, humid and fringe climates to install the vapor retarder on the exterior side, rather than the interior or living space side, of the exterior walls provided that the permeability of the exterior wall has a vapor retarder or exterior covering with a permeability not greater than 1.0 perm and the interior or living space side of the wall with a permeability of 5 perms or greater. The waiver also requires manufacturers to add a statement and a map to the data plate of the home stating that the house is only suitable for installation in humid and fringe climates.

Under 24 CFR 3282.14 "Alternative construction of manufactured homes", Section (a), HUD "encourages innovation and the use of new technology in manufactured homes" and "will permit manufacturers to utilize new designs or techniques not in compliance with the Standards" and "(2) Where such construction would provide performance that is equivalent to or superior to that required by the Standards." However, manufacturers using such waivers shall provide notice to prospective purchasers regarding the particulars of the waiver prior to actual purchase. When HUD issues a waiver, it reminds manufacturers that additional measures are likely needed in the design and construction of their homes to sufficiently abate the moisture problems in hot, humid climates and, therefore, comply with other requirements in the Standards, such as the performance requirements of CFR 3280 "to insure durable, livable, and safe housing".

Regardless of the waiver and alternative construction, the use of vinyl covered wallboard in hot humid climates has never been required for CFR 3280.504(b)(1). In fact, a vapor permeable wallboard has at all relevant times been available under CFR 3280.504(b)(1).

### MANUFACTURER HOUSING DEFECTS IN HOT, HUMID CLIMATES

The most egregious defect of manufactured housing in the hot, humid, and fringe climates of the southeastern United States is the installation of vinyl covered wallboard as a vapor barrier or as a vapor retarder on the interior or living space side of the wall, ceiling, and floor areas of the home which are the colder inside surfaces. Such construction guarantees that humid, hot, moisture-laden outside air water vapor that penetrates the exterior envelope (walls, roof, underside belly board) of the home must condense to form water on the colder back surfaces of vinyl covered wallboard as the vapor barriers or as vapor retarders which are the back-side surfaces within the walls, above the ceilings, and below the floors. This condensation water within the walls, above the ceilings and below the floor cannot escape and builds up (accumulates) resulting in deterioration of the wall boards, deterioration of the ceiling support structures, deterioration of the floor support structures with buckled floors and damaged wood trim and floor moldings, as well as the formation of an environment for the formation and growth of various types of molds within the walls, ceiling, and beneath the floors. Such construction is a clear violation of 24 CFR 3280 because it is a direct violation of "accepted engineering practices" and is not in conformance with the performance requirements of providing and insuring "durable, livable, and safe housing."

The second most egregious form of deficiency of manufactured housing in the hot, humid, and fringe climates of the southeastern U.S. is the sum package of individual point defects that allow the hot, humid, outside water vapor to penetrate the exterior building envelope. These individual point defects include; leaks and holes in the heating and cooling air ductwork systems with potential positive pressures in the belly and negative pressures within the living space drawing in outside water vapor air, failed return air ducts resulting in pulling of moist air from crawlspace, holes - tears in the belly board coverings below the floor system above the crawlspace with or without ground vapor



barriers and crawlspace skirt venting, improper sizing and operation of air conditioning systems, improper location and use of exhaust fans, electrical and plumbing pathways and devices acting as holes thru the building envelope, etc.

The above sum package of defects reflects on the quality of construction of manufactured housing and casts doubt that 24 CFR 3280 is being met since the above package of defects does not meet the performance requirements to insure "durable", livable, and safe housing and shall demonstrate "acceptable workmanship" reflecting "journeyman quality of work of the various trades."

#### EXAMPLE OF MANUFACTURED HOUSING IN HOT, HUMID CLIMATE

The double wide manufactured home located at 15101 Section Line Road, Wilmer, Alabama, is one example of manufactured housing located within the hot, humid climate of the southeastern United States. Inspection reports prepared by Healthy Homes of Louisiana, LLC and R. T. Bonney and Associates, Inc. demonstrate that the home was constructed using vinyl covered wall board for the interior living space sides of the exterior walls resulting in water vapor condensation moisture accumulating inside the perimeter walls which has caused structural deterioration and created fungal (mold) growth within the wall structure. Such construction in direct violation of accepted engineering practice within the hot, humid climate of the southeastern United States will worsen with time and eventually render the home unfit for its use as housing. This does not meet the performance requirements of 24 CFR 3280 and, thus the housing is not in compliance with the HUD Standards for manufactured housing.

FROM :

FAX NO. : 4103296548

Oct. 13 2006 03:16PM P2

## KONDNER ENGINEERING AND TECHNICAL SERVICES

19624 DOWNES ROAD

PARKTON, MARYLAND 21120

Telephone 410-329-6548

CIVIL ENGINEERING  
SITE EVALUATION  
SITE PLANNING  
SOIL TEST BORINGS  
LABORATORY TESTING  
ENGINEERING REPORTS  
ENVIRONMENTAL STUDIES

ENGINEERING SERVICES FOR LAWYERS  
FORENSIC ENGINEERING  
FOUNDATION ENGINEERING  
UNDERGROUND STRUCTURES  
CONCRETE & STRUCTURAL DESIGN  
EARTH DYNAMICS  
CONSTRUCTION INSPECTION

### WATER VAPOR CONDENSATION DAMAGE TO MANUFACTURED HOUSING IN THE HOT, HUMID CLIMATE OF THE SOUTHEASTERN UNITED STATES

For

Beasley, Allen, Crow, Methvin, Portis & Miles, P.C.  
Mr. Gibson Vance  
218 Commerce Street  
Montgomery, Alabama 36104

October 13, 2006

By

  
Dr. Robert L. Kondner, P.E.



FROM :

FAX NO. :4103296548

Oct. 12 2006 10:21PM P3

1

## INTRODUCTION

The hot, humid climate of the southeastern part of the United States requires careful consideration of potential moisture problem mitigation during the construction and siting of manufactured housing governed by the Department Of Housing And Urban Development (HUD) under 24CFR3280.

## CLIMATIC LOCATIONS

The geographic areas of the southeastern U.S. deemed to be within these hot, humid and fringe climatic conditions are shown in Figure 1 as expressed by HUD in the Federal Register, Vol. 67, No. 79, April 24, 2002. All or parts of Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Texas denoted by counties, are deemed by HUD to be within the hot, humid and fringe climatic conditions.

FROM :

FAX NO. : 4103296548

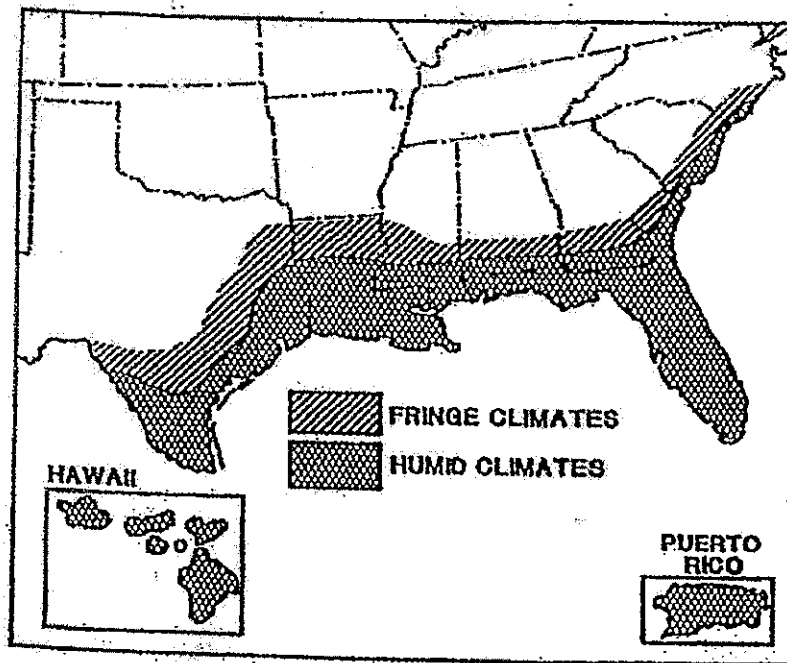
Oct. 12 2006 10:22PM P4

2

20402 Federal Register/Vol. 67, No. 79/Wednesday, April 24, 2002/Rules and Regulations

**Humid and Fringe Climate Map**

FIGURE 1



F. The following areas of local governments (counties or similar areas, unless otherwise specified), listed by State, are deemed to be within the humid and fringe climate areas shown on the Humid and Fringe Climate Map, and this waiver may be applied to homes built to be sited within these jurisdictions:

**Alabama**

Baldwin, Barbour, Bullock, Butler, Choctaw, Clarke, Coffee, Conecuh, Covington, Crenshaw, Dale, Escambia, Geneva, Henry, Houston, Lowndes,

Marion, Mobile, Monroe, Montgomery, Pike, Washington, Wilcox

**Florida**

All counties and locations within the State of Florida.

**Georgia**

Appling, Atkinson, Bacon, Baker, Ben Hill, Berrien, Brantley, Brooks, Bryan, Calhoun, Camden, Charlton, Chatham, Clay, Clinch, Coffee, Colquitt, Cook, Crisp, Decatur, Dougherty, Early, Echols, Effingham, Evans, Glynn, Wayne, Grady, Irwin, Jeff Davis, Lanier, Lee, Liberty, Long, Lowndes, McIntosh, Miller, Mitchell, Pierce, Quitman,

Randolph, Seminola, Taitnall, Terrell, Thomas, Tift, Turner, Ware, Worth

**Louisiana**

All counties and locations within the State of Louisiana.

**Mississippi**

Adams, Amite, Clairborne, Clarke, Copiah, Covington, Forrest, Franklin, George, Greene, Hancock, Harrison, Hinds, Issaquena, Jackson, Jasper, Jefferson, Jefferson Davis, Jones, Lamar, Lawrence, Lincoln, Pearl River, Perry, Pike, Rankin, Simpson, Smith, Stone, Walthall, Warren, Wayne, Wilkinson

Federal Register/Vol. 67, No. 79/Wednesday, April 24, 2002/Rules and Regulations 20403

**North Carolina**

Brunswick, Carteret, Columbus, New Hanover, Onslow, Pender

**South Carolina**

Jasper, Beaufort, Colleton, Dorchester, Charleston, Berkeley, Georgetown, Horry

**Texas**

Anderson, Angelina, Aransas, Atascosa, Austin, Bastrop, Bee, Bexar, Brazoria, Brazos, Brooks, Burleson, Caldwell, Calhoun, Cameron, Camp, Cass, Chambers, Cherokee, Colorado,

Comal, De Witt, Dimmit, Duval, Falls, Fayette, Fort Bend, Franklin, Freestone, Frio, Gavelston, Goliad, Gonzales, Gregg, Grimes, Guadalupe, Hardin, Harris, Harrison, Hays, Henderson, Hidalgo, Hopkins, Houston, Jackson, Jasper, Jefferson, Jim Hogg, Jim Wells, Karnes, Kaufman, Kennedy, Kinney, Kleberg, La Salle, Lavaca, Lee, Leon, Liberty, Limestone, Live Oak, Madison, Marion, Matagorda, Maverick, McMullen, Medina, Milam, Montgomery, Morris, Nacogdoches, Navarro, Newton, Nueces, Orange, Panola, Palk, Rains, Refugio, Robertson,

Rusk, Sabino, San Augustine, San Jacinto, San Patricio, Shelby, Smith, Starr, Titus, Travis, Trinity, Tyler, Upshur, Uvalde, Val Verde, Van Zandt, Victoria, Walker, Waller, Washington, Webb, Wharton, Willacy, Williamson, Wilson, Wood, Zapata, Zavala

Dated: April 16, 2002.

John C. Weicker,

Assistant Secretary for Housing-Federal Housing Commissioner.

(FR Doc. 02-2860 Filed 4-23-02; 8:45 am)

BALING CODE 4219-27-P

FROM :

FAX NO. : 4103296548

Oct. 13 2006 03:16PM P3

3

### MANUFACTURED HOUSING PERFORMANCE IN HOT, HUMID CLIMATES

For years manufactured housing in the hot, humid climate of the southeastern part of the United States has suffered from water vapor condensation moisture problems caused by humid, hot, moisture – laden outside air penetrating the exterior envelope of the home and coming into contact with cooler, less permeable interior surfaces such as vinyl wall or floor coverings, resulting in soft and deteriorating wallboards, extensive mold formation, buckled floors, damaged wood trim and molding, and health concerns that have prevented the manufactured housing from meeting the performance requirements of HUD 24CFR 3280.303(b) that “all construction methods shall be in conformance with accepted engineering practices to insure durable, livable, and safe housing and shall demonstrate acceptable workmanship reflecting journeyman quality of work of the various trades”.

It is important to consider the relative permeability of various wall, ceiling, and floor products used in manufactured housing in the hot, humid, and fringe climates of the United States. For example, 3/8 inch gypsum wall board laminated with paper having a water based top coat had a measured permeability of 11.44 perms while the same wall board laminated with 4 mil vinyl had a measured permeability of 0.42 perms, a difference of 2724 percent, resulting in a nearly impermeable inside wall surface when vinyl is used as the exterior wall living space side covering. This virtually guarantees the condensation of water vapor on the backside of the vinyl covered surface within the exterior wall structure.

Note that the requirements of 24 CFR 3280.504(b)(1) Exterior walls, with a vapor barrier not greater than 1.0 perm installed on the living space side of the wall is not feasible in hot, humid climates. However, the requirements of 24 CFR 3280.504(b)(2) with an external covering having a permeability of not less than 5.0 perms results in a house that can “breathe” and is suitable for use in the hot, humid climate of the southeastern United States.

FROM :

FAX NO. :4103296548

Oct. 12 2006 10:24PM P6

4

In response to the extensive history of complaints of the damages caused by these water vapor condensation moisture problems in hot, humid climates, HUD in March 2000 issued a waiver process for CFR 3280.504 "Condensation control and installation of vapor retarders." Prior to March 2000, CFR 3280.504 did not make a distinction among the various climatic conditions of the United States for water vapor condensation control and the construction installation of vapor retarders. The waiver process allows manufacturers of manufactured houses constructed to be sited in hot, humid and fringe climates to install the vapor retarder on the exterior side, rather than the interior or living space side, of the exterior walls provided that the permeability of the exterior wall has a vapor retarder or exterior covering with a permeability not greater than 1.0 perm and the interior or living space side of the wall with a permeability of 5 perms or greater. The waiver also requires manufacturers to add a statement and a map to the data plate of the home stating that the house is only suitable for installation in humid and fringe climates.

Under 24 CFR 3282.14 "Alternative construction of manufactured homes", Section (a), HUD "encourages innovation and the use of new technology in manufactured homes" and "will permit manufacturers to utilize new designs or techniques not in compliance with the Standards" and "(2) Where such construction would provide performance that is equivalent to or superior to that required by the Standards." However, manufacturers using such waivers shall provide notice to prospective purchasers regarding the particulars of the waiver prior to actual purchase. When HUD issues a waiver, it reminds manufacturers that additional measures are likely needed in the design and construction of their homes to sufficiently abate the moisture problems in hot, humid climates and, therefore, comply with other requirements in the Standards, such as the performance requirements of CFR 3280.303(b) "to insure durable, livable, and safe housing".

FROM :

FAX NO. :4103296548

Oct. 12 2006 10:25PM P7

5

#### MANUFACTURER HOUSING DEFECTS IN HOT, HUMID CLIMATES

The most egregious defect of manufactured housing in the hot, humid, and fringe climates of the southeastern United States is the installation of a vapor barrier or vapor retarder on the interior or living space side of the wall, ceiling, and floor areas of the home which are the colder inside surfaces. Such construction guarantees that humid, hot, moisture -- laden outside air water vapor that penetrates the exterior envelope (walls, roof, underside belly board) of the home must condense to form water on the colder back surfaces of the vapor barriers or vapor retarders which are the back -- side surfaces within the walls, above the ceilings, and below the floors. This condensation water within the walls, above the ceilings and below the floor cannot escape and builds up (accumulates) resulting in deterioration of the wall boards, deterioration of the ceiling support structures, deterioration of the floor support structures with buckled floors and damaged wood trim and floor moldings, as well as the formation of an environment for the formation and growth of various types of molds within the walls, ceiling, and beneath the floors. Such construction is a clear violation of 24 CFR 3280.303(b) because it is a direct violation of "accepted engineering practices" and is not in conformance with the performance requirements of providing and insuring "durable, livable, and safe housing."

The second most egregious form of deficiency of manufactured housing in the hot, humid, and fringe climates of the southeastern U.S. is the sum package of individual point defects that allow the hot, humid, outside water vapor to penetrate the exterior building envelope. These individual point defects include; leaks and holes in the heating and cooling air ductwork systems with potential positive pressures in the belly and negative pressures within the living space drawing in outside water vapor air, failed return air ducts resulting in pulling of moist air from crawlspace, holes -- tears in the belly board coverings below the floor system above the crawlspace with or without ground vapor

FROM :

FAX NO. :4103296548

Oct. 12 2006 10:26PM PB

6

barriers and crawlspace skirt venting, improper sizing and operation of air conditioning systems, improper location and use of exhaust fans, electrical and plumbing pathways and devices acting as holes thru the building envelope, etc.

The above sum package of individual point defects reflects on the quality of construction of manufactured housing and casts doubt that 24 CFR 3280.303(b) is being met since the above package of defects does not meet the performance requirements to insure "durable", livable, and safe housing and shall demonstrate "acceptable workmanship" reflecting "journeyman quality of work of the various trades."

#### EXAMPLE OF MANUFACTURED HOUSING IN HOT, HUMID CLIMATE

The single wide manufactured home located at 3393 Hunter Road, Columbia, Alabama, is one example of manufactured housing located within the hot, humid climate of the southeastern United States. Inspection reports prepared by Healthy Homes of Louisiana, LLC and R. T. Bonney and Associates, Inc. demonstrate that the home was constructed using vinyl covered wall board for the interior living space sides of the exterior walls resulting in water vapor condensation moisture accumulating inside the perimeter walls which has caused structural deterioration and created fungal (mold) growth within the wall structure. Such construction in direct violation of accepted engineering practice within the hot, humid climate of the southeastern United States will worsen with time and eventually render the home unfit for its use as housing. This is in violation of the performance requirements of 24 CFR 3280.303(b) and, thus the housing is not in compliance with the HUD Standards for manufactured housing.